Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for placing circuit elements into logic blocks, the method comprising:

assigning each of the circuit elements to a separate abstract block, wherein the circuit elements are part of a user design for a programmable integrated circuit and the abstract block represents a functional attribute of its assigned circuit element;

grouping each of the abstract blocks into a logic block based at least in part on a correspondence between a functional attribute of the logic block and the functional attribute of each abstract block;

removing a first one of the abstract blocks from a the logic block in response to placement information that indicates a design goal would be improved by rearranging at least a portion of the user design; and

placing the first abstract block into a different logic block on the programmable integrated circuit, wherein the functional attribute of removed abstract block corresponds with a functional attribute of the different logic block.

2. (Original) The method according to claim 1 wherein the design goal includes routability and signal timing in the user design.

3. (Original) The method according to claim 1 wherein the circuit elements include lookup tables and registers.

4. (Original) The method according to claim 1 wherein the circuit elements include DSP blocks and RAM blocks.

5. (Original) The method according to claim 1 further comprising:

determining whether placing each circuit element into the logic block violates any of a set of design rules relating to the logic block, wherein the logic blocks are grouped into clusters; and

determining whether placing each of the circuit elements into a cluster violates any of a set of design rules relating to the cluster.

6. (Original) The method according to claim 5 wherein each of the abstract blocks are grouped into a cluster based on an attraction of the abstract block to the cluster, and the attraction measures a number of nets and connections of nets absorbed into the cluster if the abstract block is placed inside the cluster.

7. (Original) The method according to claim 5 wherein each of the abstract blocks are grouped into a cluster based on an attraction of the abstract block to the cluster, and the attraction measures a number of timing critical connections absorbed into the cluster if the abstract block is placed inside the cluster.

8. (Original) The method according to claim 5 further comprising:

placing one of the abstract blocks into another logic block within the cluster if placing that abstract block into the logic block violates any of the design rules relating to the logic block; and

placing one of the abstract blocks into another cluster if placing that abstract block into the cluster violates any of the design rules relating to the cluster.

9. (Currently Amended) The method according to claim 1 wherein the logic blocks implement functions performed by two lookup tables with less than an integer k unique input variables; and the method further comprises:

determining whether grouping each of the abstract blocks into the logic block ~~placing each of the abstract blocks into the logic blocks~~ causes any of the logic blocks to have more than k unique input variables.

10. (Original) The method according to claim 1 wherein the placement information includes floorplanning information.

11. (Original) The method according to claim 1 wherein the placement information includes partition information.

12. (Currently Amended) The method according to claim 1 wherein the placement information includes data obtained by a previous ~~placing~~ placement of a portion of the user design on the programmable integrated circuit.

13. (Original) The method according to claim 1 wherein:

grouping each of the abstract blocks into a logic block further comprises grouping first and second abstract blocks into a first logic block;

removing the first one of the abstract blocks from the logic block further comprises removing the first abstract block from the first logic block; and

placing the first abstract block into a different logic block further comprises placing the first abstract block into a second logic block and placing the second abstract block into the first logic block.

14. (Currently Amended) A computer program product stored on a computer readable medium for placing circuit elements in a user design for a programmable integrated circuit into logic blocks, the computer program product comprising:

computer program instructions ~~code~~ for assigning each of the circuit elements to a separate abstract block, wherein the abstract block represents a functional attribute of its assigned circuit element;

computer program instructions ~~code~~ for grouping each of the abstract blocks into a logic block based at least in part on a correspondence between a functional attribute of the logic block and the functional attribute of each abstract block;

computer program instructions ~~code~~ for determining whether placement information indicates that a design goal would be improved by moving at least one of the abstract blocks into a different logic block; and

computer program instructions ~~code~~ for removing the at least one abstract block from a first logic block and placing the at least one abstract block into a second logic block in response to the determination based on the placement information, wherein the functional attribute of the removed abstract block corresponds with a functional attribute of the different logic block.

15. (Original) The computer program product as defined in claim 14 wherein the design goal includes signal timing and routability in the user design.

16. (Currently Amended) The computer program product as defined in claim 14 wherein the logic blocks are grouped into clusters of logic blocks, and the computer program instructions ~~code~~ for grouping each of the abstract blocks into a logic block further comprises computer program instructions ~~code~~ for grouping each of the abstract blocks into a cluster of logic blocks based on an attraction of the abstract block to the cluster.

17. (Currently Amended) The computer program product as defined in claim 16 further comprising:

computer program instructions ~~code~~ for determining whether grouping the abstract blocks into the clusters violates any design rules of the clusters; and

computer program instructions ~~code~~ for determining whether grouping the abstract blocks into the logic blocks violates any design rules of the logic blocks.

18. (Original) The computer program product as defined in claim 14 wherein some of the circuit elements are lookup tables, and some of the circuit elements are registers.

19. (Original) The computer program product as defined in claim 16 wherein the attraction measures a number of nets and connections of nets absorbed into the cluster if the abstract block is placed inside the cluster.

20. (Original) The computer program product as defined in claim 16 wherein the attraction measures a number of timing critical connections absorbed into the cluster if the abstract block is placed inside the cluster.

21. (Currently Amended) The computer program product as defined in claim 17 further comprising:

computer program instructions ~~code~~ for placing one of the abstract blocks into another logic block if placing that abstract block to the logic block violates any of the design rules relating to the logic block.

22. (Currently Amended) The computer program product as defined in claim 17 further comprising:

computer program instructions ~~code~~ for placing one of the abstract blocks to another cluster if placing that abstract block to the first cluster violates any of the design rules relating to the first cluster.

23. (Currently Amended) The computer program product as defined in claim 14 further comprising:

computer program instructions ~~code~~ for determining whether placing the abstract blocks to the logic blocks causes any of the logic blocks have more than k unique input variables,

wherein the logic blocks are configurable to implement functions performed by two lookup tables with less than k unique input variables.

24. (Original) The computer program product as defined in claim 14 wherein the placement information includes floorplanning information.

25. (Original) The computer program product as defined in claim 14 wherein the placement information includes partition information.

26. (Original) The computer program product as defined in claim 14 wherein the placement information includes data obtained by placing logic blocks that implement portions of the user design on the programmable integrated circuit.

27. (New) The method of claim 1, wherein the logic block includes a first functional attribute and a second functional attribute, and wherein grouping each of the abstract blocks into a logic block further comprises:

assigning a first abstract block associated with a first circuit element to the first functional attribute of the logic block; and

assigning a second abstract block associated with a second circuit element to the second functional attribute of the logic block, such that the logic block is assigned the functional attributes of the first and second circuit elements.

28. (New) The method of claim 27, wherein the first functional attribute of the logic block includes a register and the functional attribute of the first circuit element includes a register.

29. (New) The method of claim 27, wherein the second functional attribute of the logic block includes a look-up table circuit adapted to implement a logic function and the functional attribute of the first circuit element includes a logic function capable of being implemented by the look-up table circuit.